CHAPTER III

METHOD AND PROCEDURE

In this chapter, the selection of subjects, experimental design, collection of data its reliability, administration of tests, training program, the pilot study and the statistical techniques employed to analyse the data have been presented. This investigation is done primarily to focus on specific Yogic exercises as regards to motor fitness, physiological and psychological parameters.

SAMPLE:

The present study was conducted on male subjects of 16 to 19 years of age, studying in XI and XII grades in Government Senior Secondary School, Sector 23, Chandigarh. To ensure the selection of subjects having normally sound mind in sound body, the investigator checked the health records maintained by the school with the help of a small team of physical instructors and eliminated sixty (70) subjects finally selecting eighty (80) students. Further the selected subjects were assigned the following four (4) groups.

1. Experimental Group I (Asana)
2. Experimental Group II (Pranayama)
3. Experimental Group III (Dhyana)
4. Control Group
Due emphasis was laid an aspects like age, height, weight, past game / sports experience / participation and health records before allocating the groups to ensure homogeneity. Prior to the administration of pretest; a meeting of all the selected subjects were held in which the Principal and the teachers of Physical Education of the said school were present. The purpose of this study along with the various testing procedures and training program were explained to them in detail. Later on the selected subjects were also explained the same so that, they could grasp the importance and should suffer from no confusion what-so-ever regarding the hard work and interest they would have to put in. All the subjects agreed to co-operate whole heartedly.

The Principal and the Teacher of Physical Education also reinforced telling them to put in every ounce of their energy in the experiment in order to promote scientific investigation in general and also to enhance their knowledge and skill. However, no motivational techniques were used while collecting the data.

**EXPERIMENTAL DESIGN**

A simple random group design was adopted for this study as it seemed to be the most appropriate one. The eighty (80) subjects were classified into four equal groups with Twenty (20) subjects in each group. Three Experimental groups (Asana, Pranayama, Dhyana) and fourth as a control group.
TRAINING DESIGN

The training lasted twelve weeks. There were three sessions of one hour for each group in a week. Time was controlled for each group and the sessions commenced at 7.00 A.M. sharp. The training design was broadly classified as follows.

1. EXPERIMENTAL GROUP – I (ASANA)
   Following exercises short listed & administered on experimental group-I:
   - Surya Namaskara
   - Paschimotianasana
   - Sarvangasana
   - Halasana
   - Pavan Muktasana
   - Uthit Padmasana
   - Padanushthasana
   - Shavasana

2. EXPERIMENTAL GROUP – II (PRAYANAMA)
   Following was practiced by experimental group-II.
   - Surya Bhedana
3. EXPERIMENTAL GROUP – III (DHYANA)

Following was administered to experimental group-III.

Dot Tratka $T_{613.7}$
Candle Tratka $S_{531E}$

DESCRIPTION OF THE TREATMENT

DESCRIPTION OF ASANA EXERCISES
(Experimental Group – I)

SURYA NAMASKARA

Salutation to the Sun

Surya means Sun. Namaskar means bowing, greeting or welcome. Surya Namaskar, therefore, means greeting the sun or bowing before the sun.
Techniques

Position 1: Prayer Pose

Stand erect with feet together, palms together resting on the centre of the chest, arms relaxed against the body. Breathe in and out with awareness until the breathing is calm, relaxed and natural. The whole body should be completely relaxed, spinal column straight but not rigid.

Benefits:

This asana establishes a state of concentration, calmness and awareness of the practice being performed.
Position 2: Raised Arms Pose

Inhale deeply while slowly raising the arms above the head. Keep the arms separated, shoulder width apart. Tilt the pelvis while arching the back and bending the head back as far as is comfortable. The spinal column is arched slightly in the beginning. The amount of the arch can increase with practice.

Benefits:

This asana stretches all the abdominal organs fully, exercises the arms and shoulders, tones the spinal cord and open up the lungs.
Position 3: Hand to Foot Pose

Exhale deeply while slowly bending forward, keeping the knees straight. Place the fingers or palms of the hands beside the toes on the floor. Try to touch the knees with the forehead. The spinal column is bent forward at the hip joints. Initially bend forward only as far as is comfortable. With practice it will come easily.

Benefits:

This asana aids in preventing, relieving and eliminating stomach ailments. It reduces surplus abdominal fat, improves digestion, eliminates constipation, improves circulation and keeps the spine supple.
Position 4: Equestrian Pose

Keep the palms or the fingertips on the floor beside the feet. Inhale deeply while slowly stretching the right leg back as far as is possible, and bending the left knee. The right toe and knee touch the floor. Arch the back and look up. The spinal column is once again arched and the chin should be raised as high as is possible. After some practice the spinal arch will become very pronounced.

Benefits:
This asana tones the abdominal muscles, strengthens the muscles of the thighs and legs and induces balance in the nervous system.
Position 5: Mountain Pose

Exhale deeply while slowly stretching the right leg back and placing it beside the left leg. At the same time raise the buttocks and lower the head between the arms, so that the back and legs form two sides of a triangle. The legs and arms should be straight in the final position. Try to keep the heels on the ground and bring the head towards the knees.

Benefits:

This asana strengthens the nerves and muscles of the arms and legs, exercises the spine and stimulates circulation especially in the upper spine. It is an inverted posture which can be practiced by those who are unable to do sirshasana, the headstand pose, due to myopia.
Position 6 : Salute with 8 Limbs

Slowly lower the knees to the floor, then the chest and finally the chin. In the final position only the toes, knees, chest, hands and chin touch the floor. The spinal column is arched slightly in this balancing pose. With practice, it should be possible to touch the knees, chest and chin to the floor at the same time. Exhale and inhale as much as is necessary in this position, or retain the breath outside.

Benefits:
This asana tones the shoulders and neck muscles, strengthens leg and arm muscles and develops the chest.

Position 7 : Cobra Pose
While inhaling deeply slowly lower the buttocks and hips to the floor. Straighten the elbows, arch the back and push the chest forward. Bend the head back.

Benefits:

As given for ashtanga namaskara. Also, in this asana the abdominal stretch helps to squeeze stagnant blood from the abdominal organs and encourage a flow of fresh blood. This pose is useful for all stomach ailments, including indigestion and constipation. The arching of the back keeps the spine supple, improves circulation and revitalizes most important spinal nerves. It also has a balancing effect on many hormones.

Position 8: Mountain Pose
Relax the arch and exhale deeply, while slowly raising the buttocks and lowering the heels to the floor. The hands and feet do not move from position 7. The body should look like a triangle as in position 5 with the chin tucked in close to the chest.

**Position 9 : Equestrian Pose**

While inhaling deeply slowly bring the left foot forward between the two hands. At the same time, lower the right knee down to the floor and push the pelvis forward. Arch the back and look up, with the chin as high as possible. This is the same as position 4.
Position 10: Hand to Foot Pose

While exhaling slowly bring the left foot forward next to the right foot. Straighten the knees and bring the forehead as close as possible to the knees without straining, as in position 3.
Position 11: Raised Arms Pose

Inhale deeply while slowly raising the body from the hip and stretching the arms overhead, shoulder width apart. Tilt the pelvis then arch the back, and raise the chin as high as possible, as in position 2.
Position 12: Prayer Pose

Exhale while bringing the palms together in front of the chest, standing erect as in position 1. Relax the body and watch the breath return to normal.

Benefits:

When one performs surya namaskara synchronizing the physical movements with the breath, all the muscles, joints and major internal organs are stimulated and balanced. It is for this reason that surya namaskara is an ideal practice for people with only a limited amount of
time to devote to the practice of asana and pranayama. Surya namaskara also influences the pineal gland and the hypothalamus, helping to prevent pineal degeneration and calcification. This balance the transition period between childhood and adolescence in growing children.

(Saraswati, Satyananda 1990)

**PASCHIMOTTANASAN**

Paschimottan is comprised of two words : Paschima and Uttan, Paschima means back. Uttan means to stretch or straighten. Therefore, Paschimottan means stretching the back.

**Technique :**

Sit straight on the ground. Stretch the legs straight and keep them touching each other. Breathe-out slowly, contract the anus and take the lower abdomen inwards towards the spine and upwards. Stretch out your
arms slowly by bending the trunk forward and catch hold of the toe with the two hands and then slowly bend your trunk without any jerk till your forehead touches the knees. Retain this pose so long as you can hold the breath.

Benefits:

This series effects the muscles on the sides of the trunk, waist and backs of the legs. It stimulates the nervous system and alleviates nervous depression. It keeps the spine supple and massages the abdominal organs. Appetite and digestion are improved, and constipation relieved.

(Saraswati, Satyananda, 1990)

SARVANGASANA

Sarvanga is comprised of two Sanskrit words: Sarva and Anga. Sarva means all or the whole. Anga means body. Therefore, Sarvanga means the posture of the whole body.
Technique:

Lie down flat on the back, palms down beside the thighs. Raise the legs with bent knees and slowly roll the back up to the shoulders until the chin touches the chest. Use the hands as a support, resting on the elbows. Straighten the legs vertically. The body should now be at a right angle to the head, neck, shoulders and elbows. The back should be straight, the chin pressing the chest. To return to the lying position, firstly bring the knees down to the forehead, place the hands on the floor, and lower the body and legs slowly to the floor. Hold the breath in while raising and lowering the body.

Benefits:

Daily practice of sarvangasana supplies the thyroid gland with a rich flow of blood, thus stimulating this gland which is responsible for respiratory exchange, genital and sexual development, and the growth of...
the bones. So young children whose bodies have not developed normally should practice this asana. Children with normal growth should only practice this asana in a dynamic form, as one of many postures, in order that natural development may continue on its own. After puberty this asana may be practiced for greater benefits.

(Saraswati, Satyananda, 1990)

HALASANA

Hala means plough. Halasana, therefore, means plough posture. This posture is called plough from its supposed resemblance to primitive used in fields for ploughing.
Technique:

Lying flat with hands at the sides, raise the legs straight to the vertical and continue to pass them overhead, lifting the body as in shoulder stand. However, the legs with straight knees behind the head until the toes touch the ground. To begin with the posture only a second or two to begin with gradually extending the period later.

Benefits:

Halasana improves the functioning of the abdominal organs, kidney, liver and pancreas. It makes the spine supple and strong. It cures rheumatism, lumbago, nerve pains, cramps in the head, chronic constipation, diabetes, piles and insomnia. It stimulates and tones up thyroid and parathyroid glands. This asana is wholesome for all the organs of the body. (Kaul, H. Kumar 1987).

PAVANMUKTASANA

Pavanmuktasana means wind relieving posture or anti-gastric posture.
Technique:

For this asana lie flat on the ground. Bend both the legs at knee, wrap the arms lightly around and press together against the abdomen. Raise the head slowly and place the nose in between the both knees as long as possible.

Benefits:

Sometimes bad gases in the stomach causes heartburn, pain in the ears, heaviness in head etc. Due to excess of this, one may even have his body bent like a bow. All limbs get shaky. The same can be cured by the practice of this asana. More excessive fat in the stomach will deprive one of sound sleep. A slight pressure on the stomach creates pain, which may ultimately affect the heart. Lack of exercise to the heart, lungs, and as a matter of fact to the entire body, is the cause of every disease. (Umeshchandraj, 1959 A.D.)

UTHIT PADMASANA

Uthit means to raise up or to lift up. Padmasana mans lotus posture. Thus Uthit Padmasana means to lift the legs in a lotus posture.
Technique:

Sit in a Padmasana. Place the palms on the floor next to the thighs. Inhale, and raise the body from the floor and balance on the hands as long as is possible. Then come back to the sitting position and exhale. Rest in the sitting position. Repeat this pose with the legs crossed the other way.

Benefits:

This pose is especially good for children. Arms, wrists and shoulders are strengthened and trembling in the hands stops. It generates control, coordination and dexterity. The abdominal muscles are exercised. Balance is also developed. (Saraswati, Satyananda 1990).

PADANUSHTHASANA:

To sit on the tip of the toe is called padanushthasana.
Technique:

Sit on the tip toe. Cross one leg over the other. When balance is attain, put the hands together at chest height. Keep absolutely still, fixing the gaze on the hands as long as possible, while you breathe slowly and deeply.

Benefits:

Vishnoudevananda (1964) advocates that this posture develops to the highest degree the possibilities of mental concentration and unification of thought as well as physical balance.

SHAVASANA:

This asana is commonly called Relaxation Pose. It is one of most valued and highly desired asana of the yoga system. The literal meaning of Shava is dead body. Therefore, Shavasana means the posture of dead body.
Technique:

Lie on the back with the feet and arms comfortably apart. The spinal column should be straight but not rigid and the arms rest on the floor slightly away from the body with the palms up. The head should be in line with the spine and the eyes and mouth are gently closed. Let the whole body relax completely.

Benefits:

Shavasana is an excellent asana for complete physical, mental and spiritual relaxation and refreshment. Tension, irregular breathing or faulty breathing can cause many diseases. Rhythmic breathing in Shavasana is highly beneficial for the body and mind. This asana removes all mental tension, stress and strain; physical fatigue and stimulates the entire nervous system. It also eliminates toxins accumulated in the body, recharges organism with prana; restores energy and cures high blood pressure, heart ailments, insomnia, nervous disorders and depression. This asana when performed correctly gives rest, peace, tranquility and relaxation to body and mind.

DESCRIPTION OF PRANAYAMA EXERCISES
(Experimental Group - II)

Suryabhedna

“Surya” in Sanskrit means ‘Sun’ and “Bhedana” is to ‘open’. In this form of Pranayama the right nostril is used for inhalation and left for exhalation. In each round this same procedure is to be repeated.
Technique:

Sit in any comfortable asana. Close the eyes and the mouth. Close the left nostril with your right thumb and little finger. Slowly inhale without making any sound quite comfortably through the right nostril. Then close the breath firmly pressing the chin against the chest (Jalander Bandha). Retain the breath as long as one can. Then exhale very slowly without making any sound through the left nostril by closing the right nostril with the thumb.
Benefits:

This Pranayama brings the body temperature into equilibrium and controls the functions of the catabolism. The digestion is improved and the nervous system fortified. The sinuses are also cleared.

(Ananda 1990)

SHEETALI:

SHEETALI means pleasantly feelings. This variety of Pranayama as mentioned above, has a cooling effect.

Technique:

Sitting in suitable posture, the tongue is drawn out of the mouth and its edges are turned upward to form a channel. During purka (inhale) the air is slowly sucked in through this channel. After the purka (inhale)
the tongue is taken in the mouth is closed. Kumbhaka (retention) is done along with Jalander Bandha (chin lock), and then rechaka (exhale) is done through both the nostrils.

**Benefits:**

This practice purifies the blood and prevents and relieves high blood pressure. It induces mental, psychic and muscular calmness, and also eliminates the feeling of thirst.

(Saraswati, Satyananda 1990)

**SITKARI:**

Sitkara is a sound made by drawing in the breath. This variety of pranayama gets its name from this sound which is produced while doing purka (inhalation).
Technique:

Sit in any comfortable asana with spine erect and clench your jaw with teeth firmly clutching over each other. Open the lips but do not open the mouth. Inhale quickly by sucking air into the mouth through teeth in a hissing manner. The teeth and tongue should not move and their position should not altered at any time. After complete inhalation exhale through the nose.

Benefits:

Dunne, Desmond (1961) recommended Sitkari for improving the general vigour of the body, for over-coming drowsiness and indolence and, in some cases, for conquering hunger and thirst.

“Sitkari increases the beauty and vigour of the body. It purifies the blood stream and prevents disease. It aids digestion, removes hunger, thirst, indolence and cools the body”.

(Jaggi, O.P. 1973)
KAPALABHATI:

In Sanskrit ‘Kapal’ means the head or the skull and Bhati means bellowing.

Techniques:

Sit in some comfortable asana, and inhale through both the nostrils and force your breath out in quick succession till the lungs are empty. Emphasis should be laid on exhalation only. During forceful exhalation, draw the abdomen and the chest in with force so that the air may be discarded in greater quantity. Begin slowly but increase the speed.
gradually. Do it about 15 times. Exhale the last breath and retain it as long as you feel convenient. Then breathe in slowly and relax.

Benefits:

This exercise enables us to eliminate a large quantity of the toxins contained in the body, by filling the blood with oxygen and purifying the tissues and nerves. This Pranayama clears the nasal cavities and lungs. It is a remedy against deficiencies in the lymphatic system, and mucus in the nose and lungs. The exercise brings relief from asthma and tones up the body. It fortifies the salivary glands and expels bacteria that have penetrated into the nose. The solar plexus is recharged with vital energy, circulation and digestive system function more efficiently. Exercise also helps develop the powers of concentration.

(Ananda 1990)

DESCRIPTION OF MEDITATION EXERCISES
(Experimental Group – III)

TRATAKA:

Trataka signifies ‘central fixation’ in Sanskrit. This exercise is practiced to perfect the sight and improve defective vision.
CANDLE TRATAKA:

Keep the candle flame three to four feet away from your body. Candle flame in line with eye sight. Sit erect, keeping the spine straight and the body relaxed. For one minute look upon the flame with a steady gaze without blinking. Thereafter visualize the flame between the eyebrows for a minute. Then again gaze with open eyes on the flame for a while relax and close your eyes. This may be continued for five to fifteen minutes. Gradually increase the period of gazing from one to three minutes, spending equal time relaxing the eyes.

Benefits:

This exercise stimulates the nerve centers, improves concentration. It should be practiced in a progressive manner.
This exercise is done by painting yellow dot within the black circle of the size of rupee coin (approximately ½ inch or 1½ inches in diameter) on a piece of white paper 1 sq. ft. Assume Siddhasana or Padamasana and place the painting sign at a distance of eye level and one or 1½ yards away from the body. With both eyes wide open, keep gazing at pointed yellow small dot without blinking till the tears begin to flow, as soon as they do, close the eyes. Repeat this exercise and gradually increase the time period without blinking the eyes.

Benefits:

Trataka exercise removes all defects of the eyesight, and it is of particular benefit in developing spiritual powers in as much as it helps to concentrate the mental faculties. As has been said:-
“Antarlaksya-vilina-citta-pavano yogi sada vartate!
Drstya niscala-tarayabahir-adhah pasyan-napasyannapi!!
Mudr-eyam khalu sambhavi bhavati sa labdha
Prasadad-guroh!
Suny-asunya-vilaksanam sphurati tat tattvam param
Sambhavam!!”
(Sloka No. 37 – Hathayoga – Pradipika, Part IV)

“When both the life force as well as the mind get absorbed in the Yogi sitting in a state of Trataka, concentrating his unwavering gaze on the spot illumined like a star, that state is called the superb ‘Sambhavi’ state. This state can only be achieved through the good grace of the teacher and through divine indulgence. While in this state, the void less void generates wonderful and sublime ‘Sivatatva’. This state annihilates all woes, Lord Siva, the knower of all Tantras, has kept it secret. It emancipates, it absorbs. Its votary, while fixing his unblinking gaze externally on the illumined spot, is in communion with his inner self.”
(Dhirendra Brahmachari, 1965)

Meditation helps us to rid ourselves of emotional conflict, inner discard and psychological tension. It completely purifies the mind and releases it from unconscious obstructions. Meditation enables the inner light to manifest itself. This is responsible for the awakening of self-awareness, hence one may penetrate to the very centre of life’s highest values by transcending the external & logical world.
(Anand 1981)
CONTROL GROUP

No specific treatment was given to Control group but they used to do general exercises, such as Jogging, Couple of short, Sprints and Muscles Stretching exercises to ensure that the subjects would have warm up to participate in general physical activities.

SELECTION OF VARIABLES

Keeping in view the significance of the investigation, the following variable were selected.

1. Motor Fitness Variables
   i) Pull ups
   ii) Sit ups
   iii) Shuttle run
   iv) Standing Long Jump
   v) 50-yard dash
   vi) 600 yard run-walk

2. Physiological Variables
   i) Vital Capacity
   ii) Blood Pressure
   iii) Pulse rate

3. Psychological Variables
   i) State Anxiety
   ii) Trait Anxiety
SELECTION OF TESTS

With a view to measure the selected variables the following tests were administered to the subjects.

1. AAPHER youth fitness battery (1989) were used for testing the motor fitness of the subjects.
   i) Pull-ups: To measure the arms and shoulder strength.
   ii) Sit-ups: To measure abdomen strength and endurance.
   iii) Shuttle run: To measure the speed and agility.
   iv) Standing Long Jump: To measure power.
   v) 50 yard dash: To measure speed.
   vi) 600 yard run walk: To measure endurance.

2. To measure physiological components (Vital capacity, Blood pressure, Pulse rate) the following instruments were used.
   i) Spirometer: Vital capacity.
   ii) Sphygmomanometer and Stethoscope: Sitting blood pressure.
   iii) Stop Watch: Sitting Pulse rate.

3. State-Trait Anxiety Inventory (1984) constructed and standardized by Dr. Roma Pal and Dr. Govind Tiwari (Agra) was used to measure the state & trait anxiety of the subjects.
ADMINISTRATION OF THE MOTOR FITNESS TEST:

I) PULL-UP

Objectives: To measure the strength of the arms and shoulders in the pull-up movement.

Equipment: Horizontal Bar

Description: A horizontal bar was fixed high enough so that the subjects could hang with their arms and legs fully extended and their feet being off the floor. The subjects were asked to use the over hand grasp (palms facing away from face) on the bar. After assuming the hanging position, the subject raised his body by his arms until his chin crossed over the
bar and then lowered his body to a full hang, as in the starting position. The exercise was repeated as many times as possible.

Additional Pointer:

1. The swing of the body was not allowed during the execution of the movement.
2. The raising of the knees and kicking of the legs were not permitted.

Scoring:
The number of completed pull-ups in one minute were recorded.

II) SIT-UP

Objectives: To measure the abdominal strength and endurance of the subjects.

Equipment: Mat and Stop Watch.
Description: The subjects were asked to assume a supine lying position on the floor with knees bent to an angle, a little less than 90 degrees and hands clasped behind the neck. The feet were held down by a partner. The subject brought his head and elbows forward in a care-up motion, touching this position, the subject would go back to his starting position (supine position).

Additional Pointer:

1. The fingers remained locked behind the neck throughout the exercise.
2. The feet were held firmly by the partner at one position.

Scoring:

The number of correctly executed sit-up performed in one minute, were record as his score.
III) SHUTTLE RUN

Objective: To measure agility of the subjects.

Equipment: Two blocks of Wood and Stop Watch.

Description:

Two parallel lines, 30 feet apart, were marked on the ground. The subject stand at one of the lines with the 2 blocks at the other line. On the sound of clapper, the subjects runs to the blocks, takes one, and returns to the starting line, and places the block behind the line. Again he returns to the second block, which is carried across the starting line on the way back.
**Additional Pointer:**

1. Two trials were allowed with an interval after which another pair of students were tested.

**Scoring:**

The score is the elapsed time recorded in seconds and tenths of seconds for the better of the 2 trials.

**IV) STANDING LONG JUMP**

**Objective:** To measure explosive power of legs.

**Equipment:** Measuring Tape and Jumping Pit.
Description:

The subject stands behind a takeoff line with his feet several inches apart. Before jumping, he bends at the knees and swings the arms backward. He then jumps forward by simultaneously extending the knees and swinging the arms forward. Two trials were permitted.

Additional Pointer:

1. Measurement was taken from the take-off line to the heel or other part of the body that touched the pit nearest to the take off line.

2. Running was not permitted.

Scoring:

The score was the distance between the takeoff line and the nearest point where any part of the subject’s body touches the floor. It was measured in feet and inches to the nearest inch. Only the best trial is recorded.

V) 50 YARD DASH

Objective: To measure the running speed of the subject.

Equipment: Clapper and Stop Watches.
Description:

On the track, a 50-yard distance was marked with the starting and the finishing lines. After a short warm up, the subjects took their position behind the starting line. On the sound of the clapper, the subjects started their race and ran as fast as possible up to the finishing line.

Additional Pointer:

1. The subjects were not allowed to touch or cross the starting line.
2. Stop watch was stopped as soon as the subject touched the tape.

Scoring:

The score is the elapsed time to the nearest tenth of a second between the starting and the instant the child crosses the finish line.

VI) 600 YARD RUN WALK

Objective: To measure endurance of the subject.

Equipment: Stop Watch, Wooden Clapper.

Description:

This test was conducted in a football ground duly marked for testing purpose because sufficient space was there to conduct this test. Instructions were given to all the subjects about starting and the number
of laps they had to complete. Four subjects ran at a time. The subjects used standing start. At the sound of the wooden clapper, the subjects started running/walking.

**Additional Pointer:**

The subjects were permitted to complete the test by running or walking or both.

**Scoring:**

Time was recorded in minutes and seconds as one’s score.

**Tester’s Reliability co-efficient of correlation.**

<table>
<thead>
<tr>
<th>Tests / Measurements</th>
<th>Co-efficient of Correlation ‘r’</th>
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<tbody>
<tr>
<td>Pull-Up</td>
<td>.97</td>
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<tr>
<td>Sit-Up</td>
<td>.98</td>
</tr>
<tr>
<td>Shuttle Run</td>
<td>.82</td>
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<td>Standing Long Jump</td>
<td>.85</td>
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<tr>
<td>50 Yard Dash</td>
<td>.83</td>
</tr>
<tr>
<td>600 Yard Run Walk</td>
<td>.86</td>
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</tbody>
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**ADMINISTRATION OF PHYSIOLOGICAL TESTS:**

**VITAL CAPACITY:**

**Objective** : To measure the Vital Capacity of the subjects.

**Equipment** : Spiro meter
Description : Vital capacity was measured with the help of a Spiro meter graduated in milliliters. The Spiro meter bell was immersed in the water filled Spiro meter drum. The pointer of the scale was set at zero mark at the beginning of the test and it was placed at such a height that all subjects could perform the test from standing erect position. The subject took two deep breaths before starting the test, and then after the fullest inhalation the subject placed the mouth on mouth piece attached to the nose connection to the drum of the spiro meter. In this process care was taken that no air escaped through the edges of the mouth piece. The subject exhaled with maximum effort while bending forward slightly until the maximum volume of the air could be expelled without taking a second breath. The subjects were instructed to take care that they blew out air only through the mouth and not by the nose even partially.

Scoring : The score of Vital capacity for each subject was recorded in milliliters.

BLOOD PRESSURE :

Objective : To measure the systolic and diastolic blood pressure of the subjects.
Equipments: A sphygmomanometer and a stethoscope.

Description: Each subject was asked to sit relaxed in a chair. Care was taken to ensure that the subject was placed at ease and some time was allowed for the circulatory functions to stabilize at resting level. The cuff of the sphygmomanometer was wrapped around the bare left upper arm of the subject just above the elbow, with the lower edge approximately one inch above the anticubital space. With the earphones of the stethoscope in the tester's ears, the bell of the stethoscope was placed on the brachial artery just above the hollow of the elbow. The cuff was inflated until artery fully collapsed, no pulse beat could be heard. Pressure was slowly released as the tester watched the gauge of the mercury column. When the first sound of the pulse became audible, the reading in millimeters of mercury (mm-hg) at that very instant was recorded as systolic blood pressure. The pressure was further released gradually until a very dull and weak, beat was noted. At the same instant, the pressure in millimeter of mercury was noted which represent the diastolic blood pressure.

Scoring: The measures were recorded with the systolic pressure first, then diastolic pressure.
PULSE RATE (SITTING) :

Objective : To measure the pulse rate in sitting position per minute.

Equipment : Stop Watch

Description : The subjects were asked to sit down on a comfortable chair. The Pulse reading was taken from radial artery by putting soft pressure and feeling by four fingers of the tester and counting was made with the help of stop watch.

Scoring : Total number of pulse beats per minute for each subject was recorded as the score.

INSTRUMENT RELIABILITY :

All the instruments required for the collection of data had been obtained from the reputed suppliers of standard equipment, which were procured by the Department of Physical Education, Panjab University, Chandigarh (India). Their precision and calibration was further ensured by their repeated use on the subjects under similar condition.
ADMINISTRATION OF PSYCHOLOGICAL TEST

Objective : To measure the State and Trait Anxiety Level of the subject.

Equipment : State and Trait Anxiety Scale

Description : The possible range of the scores for the state anxiety and trait anxiety varies from 30 (minimum) to 90 (maximum). The subjects respond to each item of both the scales by rating themselves according to the standard instruction on a three point scale – (1) Always, (2) Some times and (3) Never for balancing state and trait scale equal numbers of items have been taken. High rating indicates high anxiety whereas low rating indicate low anxiety for the positive items of each scale. The weight age scores of responses will be marked 3, 2 and 1 respectively whereas reversed items will be marked 1, 2 and 3. The positive and negative items of the state and trait anxiety are given overleaf: The subjects were instructed to rate as they feel as truthfully as possible.

Scoring : State Anxiety

Positive Item : 1, 2, 4, 5, 6, 7, 10, 11, 15, 16, 19, 20, 22, 24, 25, 26, 27, 28, 29, 30 (scoring should be 3, 2, 1).
Negative Item: 3, 8, 9, 12, 13, 14, 17, 18, 21, 23 (scoring should be 1, 2, 3).

Scoring: Trait Anxiety

Positive Item: 1, 2, 3, 6, 7, 8, 10, 11, 13, 14, 15, 23, 26, 27, 28, 29, 30 (scoring should be 3, 2, 1).

Negative Item: 4, 5, 9, 12, 17, 18, 19, 20, 21, 22, 24, 25 (scoring should be 1, 2, 3).

Reliability: The test-retest reliability for State scale found to be .68 whereby the test-retest reliability for Trait scale was .76 with .73 for the total scale.

STATISTICAL ANALYSIS

To find out the significance of the differences among the groups as a result of training, the analysis of covariance (ANCOVA) was applied since the study employed the random group design and the four group were not equal with reference to the factors examined through the analysis of covariance, the final means and the adjusted final means were listed for significance. In the case of variables where the F-ratio (ANCOVA) was found significant with regard to paired adjusted means post-hoc test was applied. The level of significance chosen to test the hypothesis was chosen as .05 which was recognized as appropriate in
relation to the research process adopted and the equipment used in the study. Finally to find out the significance of the differences between pre-test and post-test means of the two experimental groups and control group 't' test was applied.